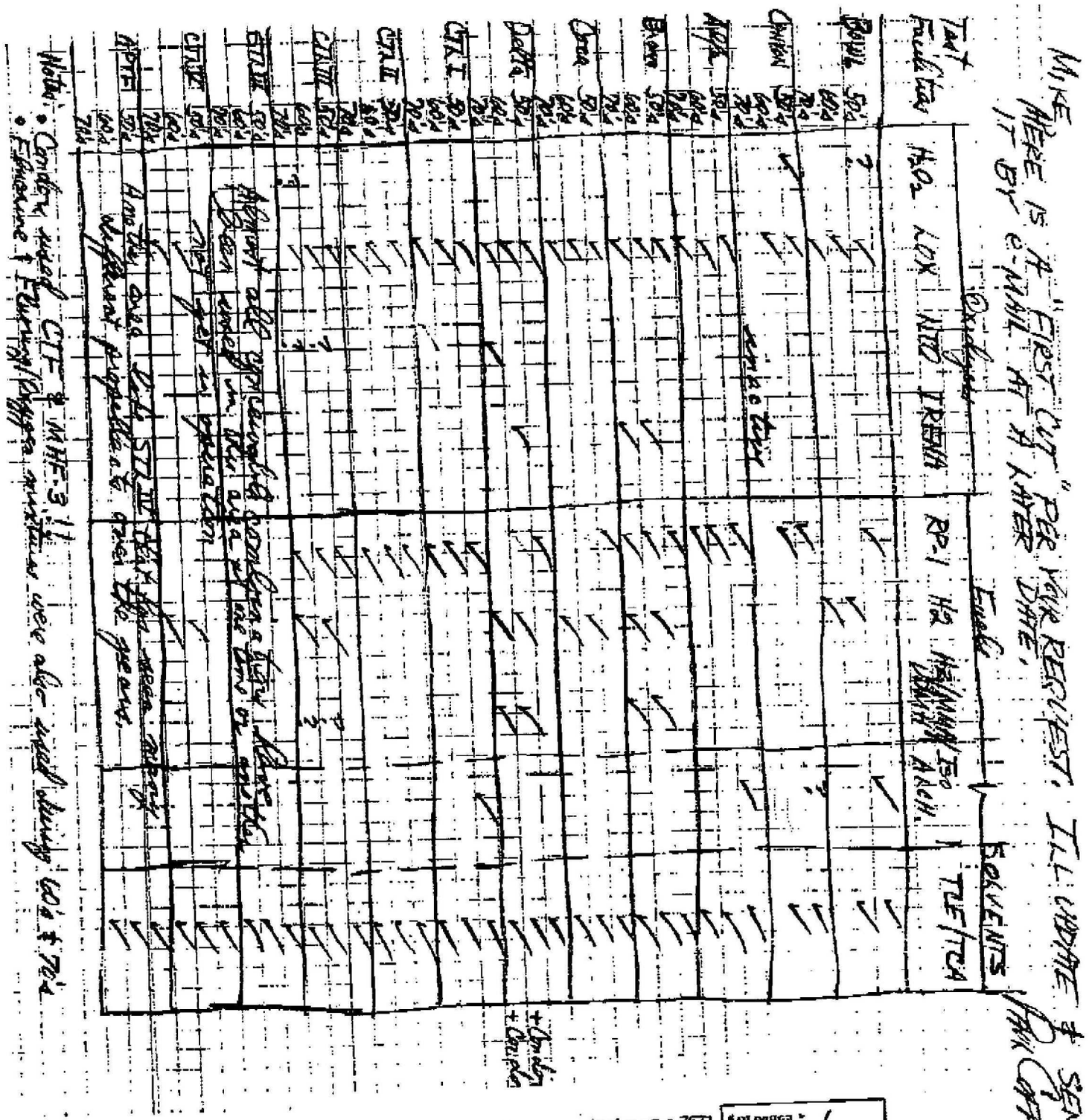
MIKE
HERE IS A "FIRST CUT" PER YOUR REQUEST. I'LL UPDATE & SEND
IT BY e-MAIL AT A LATER DATE.
PAUL COFFMAN
Exclusive
H2O LOX INTO TREATH RP-1 H2 HYDRAULICS ACCUM. TUFTDA
Fuel Gas
Power
Control
Auto
Engine
Ctrl I
Ctrl II
Ctrl III
Aptfi
Engine 1 Pressurization
Engine 2 Pressurization
Engine 3 Pressurization
Engine 4 Pressurization
Engine 5 Pressurization
Engine 6 Pressurization
Engine 7 Pressurization
Engine 8 Pressurization
Engine 9 Pressurization
Engine 10 Pressurization
Engine 11 Pressurization
Engine 12 Pressurization
Engine 13 Pressurization
Engine

Post-it® Fax Note 7671	Date 5-7-99	# of pages ▶ 2
To Kim D. Kaucke	From Mike Muhm	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

5/6/99

Kim

Here is a materials - use matrix sent to me by Paul C & Steve - a very capable attorney -

Mike

(3)
DP
EE

Ed @ Alfa

late 70s given mask to wear
Cannister type for large engine flush

Don — late 60s EL started testing valves w/one individual
then changed back

could work up to 8hrs/day w/ TCE
hood pans → in booths or outside
(ventilation)
TCE in vapor degreaser → TCA

Test Stand Calls

Leaky valves, change switch, adjust valve
no TCE use
overhaul pumps w/ RP
Valve crew, pump crew

Valve crew on for service (MMK/MHO)
Smelled MIMH (dripped out) faint whiff

CONFIDENTIAL LEVEL I - UNDER PROTECTIVE ORDER,
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California, No. CV 97-1554

HDMSe00247772

(4)
DF
EE

(Ed)

3 shifts

ALFA/COCH Install/test large engines
RP-1 / LOx, GN2, He, TCE
install engines
flush (stand next) 5-10 minutes
test → out of area
flush
not much exposure to fuel
remove engine → residual fuel in lines — on skin, inhaled
TCE → wipe parts, put in bucket, use rags

STL IV
NTO, IRFNA, MMH, UDMH
high exposure - handled carelessly
test cells - operated all time
vented differently than today ← depressurized → tank vent - vapor go off in air
smell when went in area (MMH, NTO, both)
water aspirate systems into ditch
3 shifts 20+ people (mechanics) engineers
welders, EL people, maintenance

both MMH UDMH
Came in 55 gallons drums (Graco pump) pump into storage tanks, apron, face shield
masks were available but did wear them
vent drum when pump took stroke
2-3 ft away (weekly, 1/2-1 hr)
remove valves → more exposure
sample fuel → hook up cylinder (15min)

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HDMSe00247773

(5)
DF
~~EE~~

LETF/CHTL – also fluorine, hydrazine, MMH → told to handle mine carefully (worked w/ PhDs)

APTF – similar to STL IV

Asbestos

Alfa – Atlas Sustainer engine only wrapped w/ asbestos sheet.
every engine → put on take / off
tore stuff off

CHTL → asbestos insulation } research people

CTL ~~IV~~ about 25% who worked both

cryo gaskets → asbestos (Jm gasket) → 1990–91
gaskets hung in boards
gasket cutter

Don – ~~no~~ chem (Lockheed)
Ed – service (Navy)
technicolor – film developing

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(1)

JL

Jim Lang

1963 – 1964 (8 mos) AI – Desoto
1964 – 1984 Nuclear Ops – Hot Cell, B/055
1965 → 1966 Imyoff
1968 → 1969 "
worked in all bldgs.

1984 – present Rocketdyne APTF, STL-IV-manager

1986-88 – challenger accident decline

Supervised tech instr. and ops (test stand)
↓ electrical data acqn.
↓ plumbers assy

APTF, STL IV

APTF – variety of propellants
NTO, MMH + cryo

STL IV – predominately NTO/MMH

Operations
build up – plumbing, propellant lines
– almost always wore PPE – Class A – SCBA
Class B
not posted hood

early 90's full encapsulation

open lines } potential exposure tasks
working on valves }
definitely could smell it

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②
JL

testing — zero chance
prior to pressurizing tanks → leak test.

heavy vents after → all people control center
NTO — vent to hilltop stacks — used forever ~~since 1964~~ ~~definitely~~)
previously vented to ponds
↓
late 80s changed → MMH goes to scrubber

Solvents → TCA, IPA, acetone
TCE gone by 1984

Cleaning → wipe, flush of tubings, buckets for immersion
sometimes wore gloves
squeeze bottles

60s F_2, Compound A, → ClF_5, ~~plutonium~~ burner } only used @ APTF
chlorine Pentafluoride

fluorine in area until 1990s. → after accident

Asbestos — insulation tape for wrapping lines
prior to 1984
1984 — ~~limited~~ — ~~gaskets~~
Instrumentation — mixing
ops — gaskets, asbestos blankets used for other things (welders)
NTO heaters → asbestos wrapping

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③ JL

Jim Lang

↑ Stan Bell – LEEDA
George

1985–86 – no more asbestos
facility items still remain
some gaskets still remain

Moved people day to day

1985→ Alpha/Bravo steady since late 80s.

Bravo – storable propellants [early] ?

pre 1980s – separate div

early 1970s prop → rad due to layoff (Apollo shutdown)

10–15

AI

Rad side → as likely → more likely exposure to asbestos
cut, saw, hammer

Stories

storables → could smell daily basis } still like that in 1984
specifically next test cells

mid 1980s – started tightening up
STS-IV – 6–8 ops } very busy PK XLR 132
APTF 15 ops max

daily vent of MTV

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(4)

JL

last shipment of Gramer pumps - early 90s

92 → pumper truck MMH

monitors used in 80s - did not work
different than those used today

Russ Slocum
Clarence Acherman
George Murphy
} retirees

CONFIDENTIAL LEVEL I - UNDER PROTECTIVE ORDER,

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Friday 8/21 8:00

Rocky Rasmussen
Bob Huffman

*CTL II
CTL I
BRAVO

Bob Jan 1957 layoff July 1957 (Navaho ended)
1965 – 3 month → Nov CANOGA

Jan 1957	– July 57	BOWL (PTCC)	"C" Junior Mechanic-ops.	
Nov 1957	– 1960	DELTA	instrumentation mechanic	
1960	– 1961	CTL II		
1961	– 1965	COCA		
1965	– 1968	~~BRAVO~~ CTL I*		CTL I, III
1968	– 1971	CTL III		COCA DELTA
1970 <300 hourly	1971 – 1974	COCA control center rm		lead +4 tech (1 shift)
	1974 – 1976	COCA		
	1976 – 1995	CTL III		
	1995 – present	ALFA, BRAVO		

probably worked all facilities over the years
timecard location → worked in certain zone ~~INVERT~~ ALFA, BRAVO, STL IV, H_2 CWLL ECL
AREA 1 TIME CLOCK → IL, EL, WAREHOUSE, APTF CTL I, III, COCA

layoff Jan 1961 – 1961

Rocky 1/8/58
Union organized in 1968 – no job desc. in those days

~200 people 3 shifts	1958	1959	CTL I – LO_x/H_2 F_2 ATLAS, TGE B mechanic
	1959 –	1960	CTL III ATLAS Gly, components testing
	1961 –	1965/66	CTL IV J2 program LO_x / H_2 2 shifts
~12-15 ring 10 2nd ←	1965/66 –	1967	CTL II compound A, HYPERGOL TEST, H_2 LABS NTO/hydrazine mech tech compound A CWLL
	1967 –	1968	RESEARCH (APTF) gas burners, fluorine, storable
Bravo, ALFA 07 – 3:30	1968 –	1997	CTL IV
	1997 –	present ~~ALFA~~	ALFA

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(2)
RL
BH

ROCKY-

[redacted], CTL III → LUX, H_2, FLUORINE, TCE
TRANSFER FROM BRIDGE → OWN TANKS - CLOSED SYSTEM

CTL IV → PROCEDURE → LINES WERE CLOSED, FLUSH & PURGE
USED ALCOHOL FOR FLUSH
USED TCE FOR HAND WIPE / BUCKET CLEANING
NTO IS CLOSED SYSTEM - DRIVE IN RIGS - NONE MASK UNTIL VERIFIED

[redacted] MMH PUMPED FROM DRUM → GRACO PUMP - SMELLED ~~TOXIC~~
CAUSED MMH TO VENT
~~MASK~~ FACE SHIELD ONLY
PRETTY LIKELY TO WALK AWAY FROM FUMES

MMH → VENT WENT TO WATER SUMP
NTO → HILL TOP VENT

BOB- DID NOT HANDLE SIDEWINDER
TCE USED BY EVERYONE
INST. MEDIA BROKE INTO DEAD-END SYSTEMS (TRANSDUCERS) → COULD CONTAIN FUEL/OXIDIZER
DATED
SHOULD HAVE WORN PROPER GEAR - BREATHING EQUIP NTO ONLY
SKIN PROT FROM MMH
SAFETY TRAINING (1957-70)
NAA PRIOR TO 1968
TRAINING DECLINED AFTER 1970 - 1981 (ROCKWELL STARTED)
NEW PEOPLE RECEIVED ONLY OJT (NO FORMAL TRAINING)
AFTER 1981 UAW SAFETY REP STARTED
RECENT TRAINING IS OKAY

~~ESD~~ UNION #s
1968 680 NOW 287
1970 <200

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③
RR
BH

AGREES TO INST HAD LESS EXPOSURE THAN OPS.
MANY INST. STAYED IN CONTROL CENTERS

PRA → WORST AREA → 15 inst. ~1968
25 mech.

$

~~M~~ ASBESTOS
~~MAKE~~ GASKETS – JM (JOHNS MANVILLE) USED,
INSULATION CONTAINED ASBESTOS (USED SHEETS) NB
WELDERS USED ASBESTOS BLANKETS
AROUND WELDERS (TEST STAND, HARDWARE, BOTH)

CLEANING
OUT IN OPEN – ~~RAGS~~ USED RAGS, BREAD PANS → SUPPOSED TO WEAR GLOVES (LOT DID NOT WEAR GLOVES)

~~DEGREASE~~
EL → VAPOR DEGREASER → FACE SHIELD ONLY
PROOF TEST
VALVES GO THRU E.L. (HAD RESIDUES)

ALFA/BRAVO – DID NOT ROTATE AS MUCH @ WHILE ACTIVE (MORE STABLE)
RESEARCH – ECL, CWLL, PRA

TAG RUN BACK TO 1968 → COULD FIGURE OUT ~~WHERE~~ ~~WAS~~ WHERE ASSIGNED

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HDMSe00247781

(4)
RR
BH

DELTA – FLUORINE (IRFNA)
III → LANCE – STORABLE ENGINE (IRFNA, UDMH)
~~STAGE~~ ARTAS

BRAVO – STORABLE LATE 50s
LEM Lunar Module
injector studies

CTL II → RS-27 95 → used hydrazine (Gemini project)
limited operation

CTL IV
Be CHAMBER → TYPICALLY DID NOT MESS WITH IT

Dochy – LM – airplane structure mechanic MEK
Bob – no chemicals → construction

Not sure where they got into
Not very comprehensive
Seem to concentrate on Rad stuff

[redacted]
- NTO – used Freon to clean → got a headache
Cleaned w/ Freon in clean room

Need better training

Joe Rodriguez

CONFIDENTIAL LEVEL I - UNDER PROTECTIVE ORDER,
United States District Court for the Central District of California, No. CV 97-1554

Fri 8/21 9:30 -

(1)

Jim Mitchell
Les Rogers (interviewed by UCLA)

By layoff in 1969 not many mechanics around → few mech that were left were shifted around

Les July 1956

1956 1959	NAKA B/325	"C" mechanic	built solid prop
	NAPPY VALLEY, ~~[illegible]~~		research
kind of out of research area 1959 -	TUNNEL AREA, HV.	upper research	solid propellant motors
1959	APTF (PRA)	Rocket Research	mechanic
1960s	APTF - NAN STAND		technician
	CHTL		
1964	COMPOUND A PLANT (built it up)		
early 1970s ~~1965~~	DOHL ECL ~~tested small liquid engines~~		tested small liquid engines
	↓ NAKA, et. al.		
late 1970s	BACK TO APTF - worked all stands		
1980s	all areas; STL IV	few months	

Jim June 1961

1961 -	engineer design - GG		development engineer
	CTL II (2 months)		
1961	CTL I Nozzles tests		
March 1962	CTL II test engineer		shutdown June 30, 1966
~~DE~~	DELTA 2 mos		
1962 - 69	CTL III Mod1 Mod3 -2 fuel pump		
layoff 1969 3 week			
1961 - 1977	AI → Desoto → no wages		

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②
JM
LR

1977 - 1987 Hanford Washington (wore film badge)
1987 - 1990 ATF
1990 - 92 AI design of new reactor to make tritium
1992 - 1994 B/020 tear down → wore film badge.

Les

NAKA → TCE, TCA, acetone, butyl acetate
worked with chemicals — cleaning hardware — used buckets — wore gloves
no respirators

Navy ~~ATF~~ — Hydrazine, MMH, NTO
Load into small tanks.
pumped MMH from 55 gallon drums
NTO — under pressure → closed system

Gaskets - o-rings
used JM gaskets

UCLA Gave paper list of chemicals -

Stayed w/ same eng. staff

Independent group — other technicians, engineer usually there
cleaned area during test.
done some welding — self sufficient
may have called on weld shop

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HDMSe00247784

(3)
JM
LS

had training – always had safety people/ rules

60 people – NAKA, IIV

ECL ~~&~~ azides → fumes caused headache, weakness
NAKA went to ~~all~~ nurse

~~DD~~ F_2 → always smell it
Sometimes wore gloves, didn't ~~DE~~ always wear gloves

always ~~have~~ residual NMH → spilled it @ STL IV
Cell 42

APTF more open pits
STL IV more enclosed (capsules)

methylene chloride – ECL
carrier → just gloves
ran thru large columns

Be powder – used in solid propellants
Old research people
George Hood – PRA
Glen Arts – solid propellants
Fred Ranier (Science Center) F_2
Sutton

1966 rocketdyne phone directory – Jim Mitchell

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(4)
LR

Jim -

CTL II - LOx, RP, TCE, H_2O_2, Alcohol

H_2O_2 - oxidizer → Alcohol or RP-1

TCE - poured over things
people were addictive addicted to TCE (suffered from withdrawal in vac)

DELTA LOx/H_2
CTL III LOx H_2 → Mod I
Mod I all 18 CTF ignition - Mike Hirasham
- Diane Hyatt
- Joe Bowers
- Garrison

Leak check - leak check fluid
pressurize w/ gas
LOx - visible

Gasket - ~~JM~~ JM gaskets - every ~~st~~ used used JM gaskets

hand cut gaskets from sheets in workshop areas
technician most likely to cut gaskets

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(5)
LR
JM

1969 → ~~AI~~ Rocketdyne declined
AI was building up @ Hanford
lot of design people, not many test people

Phil Horton might know about
Tim Harmon
Benzene → @ ECL

Jim Mitchell → list of training he received in 60s

Shirley Grant → may have other phone books

Stan Kacin

2. Over what period of time did you work at SSFL (on the Hill)?

Start: 1961 End: 1988 (Nov.)

worked SSME 1988 - 1995

[Use attached form to record responses for Questions 3-7]

3. Where in particular did you work? (try to identify building, test stand, etc. and record all information)? (e.g. were there particular buildings, test stands, etc.?)

STL IV - loaned to Coca

4. On average, how much time did you spend at each location? (Ask for each location. If different, probe per week, year, month)

5. Would you say that the length of time you spent at each location was typical of people who had jobs similar to yours? (if different, probe)

6. What was your job classification?

a. when you started, and

b. for how long (ask for each location)?

c. Did you have other job classifications, and, if so, when and where?

"A" mechanic (not instrumentation)

- Installed SS piping 1B test stand GG (installed, ignitors) } tested 3-4 / day / shift
- CTL II - T/P test area } 3B test stand - T/P
- GG test area
- ? (B/206 today)

COSMOLINE IN T/P - swirled / drained } inside bldg.
preservative oil
high vapor content

PRE TEST
LO_x - entry into LO_x tanks
inspection only → no cleaning
wore SCBA

READIED
Put hardware on stand
hard hat.
Safety shoes
leak checks - LO_x → visible
RP →

TEST
in control center
no one allowed outside

Wiring, nuts, bolts

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f. Did you ever wear personal protective equipment? If yes, how often?
_____Always _____ Sometimes _____Occasionally _____Never

g. Were there certain conditions and/or chemicals/materials that resulted in wearing PPE? or the type of PPE?

h. What type of PPE did you use under what conditions?

i. What training (if any) did you receive on handling chemicals?

j. What training (if any) did you receive on using PPE equipment or other safety training?

7. iv. Describe your activities and the amount of time spend doing them on days *when tests were not being done, readied, or broken down?* (Differentiate overall time, e.g. – number of years vs. how long a particular job took, e.g. – minutes/hours)

remove ignitor → put in RP-1 bucket

a. How much of your work was done indoors vs outdoors? (estimate the percentage)
____% indoors ____% outdoors

b. How large was the group of people who worked with you on these tasks?
___1-4 ___5-9 ___>10

if leak – got rid of gaskets

c. Did you usually work with the same people? (If different, probe to characterize the differences.)

d. Were there other people working in your area doing different activities? (e.g. – welding) [probe]

wiped with TCE → used buckets, no gloves, immersion used hands to remove

e. Did you or people you routinely worked with switch locations often (individually and collectively)? How many test stands did you support at a particular time?

TCE machine → vapor degreaser

Now I want to ask you about some of the health and safety practices that may have been used.

f. Did you ever wear personal protective equipment? If yes, how often?
_____Always _____ Sometimes _____Occasionally ✓ Never (CTL II)

g. Were there certain conditions and/or chemicals/materials that resulted in wearing PPE? or the type of PPE?

h. What type of PPE did you use under what conditions?

i. What training (if any) did you receive on handling chemicals?

j. What training (if any) did you receive on using PPE equipment or other safety training?

Ran test stands at Huntsville (military) → 5 3yrs in Army → used TCE extensively

[Note: This series of questions should be asked for each job location and/or job classification. Include a cross reference to table for appropriate location/job classification.]

Now I am going to ask a series of questions about work you did at each of the various test stands or areas.

7. i. Describe your activities and the amount of time spent doing them on days *when tests were being readied?* (Differentiate overall time, e.g. – number of years vs. how long a particular job took, e.g. – minutes/hours)

a. How much of your work was done indoors vs outdoors? (estimate the percentage)
____% indoors _____% outdoors

b. How large was the group of people who worked with you on these tasks?
CTL II ✓ 1-4 ___5-9 ___>10

c. Did you usually work with the same people? (If different, probe to characterize the differences.)
SAME

7 STANDS @ CTL II
LARGER GG
OTHER T/P
INSTRUMENTATION (wiring

d. Were there other people working in your area doing different activities? (e.g. – welding) [probe]

e. Did you or people you routinely worked with switch locations often (individually and collectively)? How many test stands did you support at a particular time?

Now I want to ask you about some of the health and safety practices that may have been used.

f. Did you ever wear personal protective equipment? If yes, how often?
_____Always _____ Sometimes _____Occasionally _____Never

g. Were there certain conditions and/or chemicals/materials that resulted in wearing PPE? or the type of PPE?

h. What type of PPE did you use under what conditions? Did it change over time? How?

i. What training (if any) did you receive on handling chemicals?

j. What training (if any) did you receive on using PPE equipment or other safety training?

7. ii. Describe your activities and the amount of time spend doing them on days *when tests were <u>not</u> being done?* (Differentiate overall time, e.g. – number of years vs. how long a particular job took, e.g. – minutes/hours)

a. How much of your work was done indoors vs outdoors? (estimate the percentage)
____% indoors _____% outdoors

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HDMSe00247790

b. How large was the group of people who worked with you on these tasks?
___1-4 ___5-9 ___>10

c. Did you usually work with the same people? (If different, probe to characterize the differences.)

d. Were there other people working in your area doing different activities? (e.g. – welding) [probe]

e. Did you or people you routinely worked with switch locations often (individually and collectively)? How many test stands did you support at a particular time?

Now I want to ask you about some of the health and safety practices that may have been used.

f. Did you ever wear personal protective equipment? If yes, how often?
_____Always _____ Sometimes _____Occasionally _____Never

g. Were there certain conditions and/or chemicals/materials that resulted in wearing PPE? Or the type of PPE?

h. What type of PPE did you use under what conditions? Did it change over time? How?

i. What training (if any) did you receive on handling chemicals?

j. What training (if any) did you receive on using PPE equipment or other safety training?

7. iii. Describe your activities and the amount of time spend doing them on days *when post-testing breakdown was being done?* (Differentiate overall time, e.g. – number of years vs. how long a particular job took, e.g. – minutes/hours)

a. How much of your work was done indoors vs outdoors? (estimate the percentage)
____% indoors _____% outdoors

b. How large was the group of people who worked with you on these tasks?
___1-4 ___5-9 ___>10

c. Did you usually work with the same people? (If different, probe to characterize the differences.)

d. Were there other people working in your area doing different activities? (e.g. – welding) [probe]

e. Did you or people you routinely worked with switch locations often (individually and collectively)? How many test stands did you support at a particular time?

Now I want to ask you about some of the health and safety practices that may have been used.

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BNA08757899

HDMSe00247791

8. **Were there other people working with you doing different things who were also (mechanics, technicians, engineers, etc)? Can you describe what they did and whether they tended to stay in one area or move within/among sites)**

9. **How often were people assigned to work with you temporarily?** (Try and get clarification as to period of time, particular work area.)

10. **Were there certain people you remember as being more or less likely to rotate?**

11. **Did the nature of any of your routine tasks change during your employment? If so, when? Can you describe it?**

III.Non-Routine Conditions

1. **Were there any conditions or situations you'd describe as non-routine that you can remember where <u>what</u> you did or <u>how</u> you did it might have appreciably changed?**

2. **Are there any specific incidents you remember such as spills, overfills, or other releases (accidental or planned)? Can you describe them?**

CRL II → fluorescent material in Ldx line (silicone tube)
Dumped Ldx (once)

3. a. What would typically happen after a spill occurred (containment, decon, spill response team)?

3. b. Did you and co-workers get training on safety and handling, spill containment, etc?

IV. Exposure to Specific Chemicals

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HDMSe00247792

Now I would like to ask some questions about specific chemicals you may remember working with. For example:

1. **Did any of your work involve fueling operations (hydrazine, or RP1 etc.)?** (Clarify as to time period and location) ***(Ask the following questions for all locations where hydrazine was used or RP1)***

   a. How was fuel delivered to the engine (closed dip stick & pressure system)?

   b. Were pumps used to transfer hydrazine (RP1) from 55-gallon drums to tanks? How often was transfer from drums vs closed system?

   c. Was this work performed indoors? If so, was there special ventilation equipment?

   ___Open Air ___Inside Test Chamber _____Other (specify)

   d. Did you ever wear personal protective equipment? If yes, how often?
   _____Always _____ Sometimes _____Occasionally _____Never

   e. Please describe the PPE used.

   f. Did you ever smell hydrazine (RP1)?
   _____Frequently _____Occasionally ____Never

   g. Do you think you ever got any hydrazine (RP1) on your skin?

2. **Did you work in cleaning operations or work with any cleaning solvents?**

   c. Do you recal any particular ones? Any others? (List from Kim)

   d. In what ways did you handle them or come in contact with them (e.g. – wiping, Flushing, imersion)

   e. How often would you work with or use (name chemical)? Was it

   _____Daily _____Weekly _____Monthly

   d. Was this work performed indoors? If so, was there special ventilation equipment?

   ___Open Air ___Inside Test Chamber _____Other (specify)

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HDMSe00247793

e. Did you ever wear personal protective equipment? If yes, how often?

_____Always _____ Sometimes _____Occasionally ____Never

f. Please describe the PPE used.

g. Was a vapor recovery system used? ___Yes ____No ____Do Not Know

3. Do you recall working with any other specific chemicals?

a. What were they? Any others (read list from Kim on likely chemicals)

b. In what way did you handle them or come in contact with them? Was it wiping, Flushing, imersion, other?

c. Do you remember using any PPE or other special precautions? What specifically?

d. How were they stored?

e. Did you think they were hazardous?

f. Why?

4. Asbestos

a. Did you or the workers around you mix and apply insulation to pipes or other surfaces?

b. Did you or your immediate co-workers repair pipes or other types of insulation?

c. Did your work involve wearing gloves to protect your hands from flames or hot surfaces?
_____Always _____ Sometimes _____Occasionally ____Never

d. Did your work involve changing gaskets? Please describe.

e. Did you grind them off?

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f. What about working with wiring insulation?

g. Did you ever wear personal protective equipment? If yes, how often?
_____Always _____ Sometimes _____Occasionally _____Never

h. Please describe the PPE used.

V. Indicators of Exposure

The last set of questions relates to the perceptions and symptoms associated with acute exposures and "modified" by the exposures, but without getting too involved in an occupational health status history. With the exception of true allergies, individuals generally respond similarly to similar chemicals, and, as such, the questions will help determine the initial "concentration" of the chemical exposure and will address areas related to the assessment of effects.

1. When you worked at Rocketdyne:

a. Did you smell any specific chemical odors (where, when, how long, how often)?

(For each response in (a) above, ask:)
b. What did they smell like?

c. Did you ever get chemicals on your skin, and if so, where, when, how, how often?

d. What type of PPE was available?

e. Do you remember if it was routinely used? Did anyone monitor the use of PPE?

f. Did you ever experience any problems with the PPE you used? For example, did you notice leakages?

2. Do you recall seeing smoke or gases escaping routinely? (before, during or after and describe the appearance and odor)?

3. Did you or anyone else you knew experience the following? If yes, how often? (repeat for each symptom)

a. eye irritation,

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b. nose or throat irritation,

c. itching and skin rashes, or

d. other problems?

4. **What were you (they) doing?**

5. **Were you in a medical surveillance program?**

6. **Do you remember having a pre-employment physical?**

7. **Did you receive medical testing following an injury or potential exposure (company or personal physician)?**

8. **Do you remember if you ever got any results back?**

VI. Closing Questions

1. **Did you work with chemicals before you came to the Hill (Where, When, Doing What, and for How Long)?** (clarify pre-Rocketdyne vs. other locations at Rocketdyne)

2. **How many people that worked with you had similar pre-Rocketdyne employment?**

3. **Are there any other things you can tell us that might help determine whether or not you or other workers have been exposed to chemicals?**

4. **Anything else?**

5. **Who else would you suggest we contact so we can better understand possible worker exposure to chemicals at Rocketdyne?**

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AREA I/II BLDG/TS	YES	NO	JOB DESCRIPTION	START	END	COMMENTS	REF
I APTF							
I BOWL							
I CANYON TRR							
I Hap-Val							
I NAKA							
I (???)							

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BNA08757905

HDMSe00247797

AREA I/III BLDG/TS	YES	NO	JOB DESCRIPTION	START	END	COMMENTS	REF
II ALFA							
II BRAVO							
II COCA							
II DELTA							
II EEL							
II (???)							

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AREA I/III BLDG/TS	YES	NO	JOB DESCRIPTION	START	END	COMMENTS	REF
III CTL-III							
III ECL							
III STL-IV							
III (???)							

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Stan Kacin

Questions 3 through 7

3 shifts

lubricants (copper?) silicone lube

When Tests Were Being Readied?

Area I/II/III Bldg/TS	Name or Initials	How Much Time Start	How Much Time End	Similar Jobs Yes	Similar Jobs No	Out vs. In %	Out vs. In %	Size of Group 1-4	Size of Group 5-9	Size of Group >10	Same People or Different	Switch Locations	Wear PPE? Always	Wear PPE? Some	Wear PPE? Occ	Wear PPE? Nev	PPE Under What Conditions	Training On-the-Job	Training Chemicals	Training PPE
CTL II	SK	61	62					2 (GG) 4 (TIP)			SAME	no				✓	not needed		RP-2(?), LDx → no PPE	
CTL IV Monitor 3	SK	62 (5½ mo)	67									yes							IPN/LDx → alt.	
COCA	SK	62 (weekends, 4-5 months)	67																GEMINI ATTITUDE CONTROL	

→ mechanic tech → instrumentation A → instrumentation tech [tech directed mechanics below lead man]

ETEC → insulation (asbestos)

test stand set up → dig not need to clean up if took apart (used water)

When Tests Were NOT Being Readied?

Area I/II/III Bldg/TS	Name or Initials	How Much Time Start	How Much Time End	Similar Jobs Yes	Similar Jobs No	Out vs. In %	Out vs. In %	Size of Group 1-4	Size of Group 5-9	Size of Group >10	Same People or Different	Switch Locations	Wear PPE? Always	Wear PPE? Some	Wear PPE? Occ	Wear PPE? Nev	PPE Under What Conditions	Training On-the-Job	Training Chemicals	Training PPE
wove dust mask Controlled dust 12-15yr.																				
B/055	radiation badge																			

} FACILITIES (unusual)

When post-testing breakdown was being done

Area I/II/III Bldg/TS	Name or Initials	How Much Time Start	How Much Time End	Similar Jobs Yes	Similar Jobs No	Out vs. In %	Out vs. In %	Size of Group 1-4	Size of Group 5-9	Size of Group >10	Same People or Different	Switch Locations	Wear PPE? Always	Wear PPE? Some	Wear PPE? Occ	Wear PPE? Nev	PPE Under What Conditions	Training On-the-Job	Training Chemicals	Training PPE

When tests were not being done, readied or broken down

Area I/II/III Bldg/TS	Name or Initials	How Much Time Start	How Much Time End	Similar Jobs Yes	Similar Jobs No	Out vs. In %	Out vs. In %	Size of Group 1-4	Size of Group 5-9	Size of Group >10	Same People or Different	Switch Locations	Wear PPE? Always	Wear PPE? Some	Wear PPE? Occ	Wear PPE? Nev	PPE Under What Conditions	Training On-the-Job	Training Chemicals	Training PPE

BNA0857908

HDMSe00247800

Questions 3 through Questions 3 through 7

When Tests Were Being Readied?

Area I/III Bldg/TS	Name or Initials	Area I/III Bldg/TS	Name or Initials	How Much Time		Similar Jobs		Out vs. In		Size of Group			Same People or Different	Switch Locations	Wear PPE?				PPE Under What Conditions	Training		
				Start	End	Yes	No	%	%	1-4	5-9	>10			Always	Some	Occ	Never		On-the-Job	Chemicals	PPE

When Tests Were NOT Being Readied?

Area I/III Bldg/TS	Name or Initials	Area I/III Bldg/TS	Name or Initials	How Much Time		Similar Jobs		Out vs. In		Size of Group			Same People or Different	Switch Locations	Wear PPE?				PPE Under What Conditions	Training		
				Start	End	Yes	No	%	%	1-4	5-9	>10			Always	Some	Occ	Never		On-the-Job	Chemicals	PPE

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When post-testing breakdown was being done

Area I/III Bldg/TS	Name or Initials	Area I/III Bldg/TS	Name or Initials	How Much Time Start	How Much Time End	Similar Jobs Yes	Similar Jobs No	Out vs. In %	Out vs. In %	Size of Group 1-4	Size of Group 5-9	Size of Group >10	Same People or Different	Switch Locations	Wear PPE? Always	Wear PPE? Som	Wear PPE? Occ	Wear PPE? Nev	PPE Under What Conditions	Training On-the-Job	Training Chemicals	Training PPE

When tests were not being done, readied or broken down

Area I/III Bldg/TS	Name or Initials	Area I/III Bldg/TS	Name or Initials	How Much Time Start	How Much Time End	Similar Jobs Yes	Similar Jobs No	Out vs. In %	Out vs. In %	Size of Group 1-4	Size of Group 5-9	Size of Group >10	Same People or Different	Switch Locations	Wear PPE? Always	Wear PPE? Som	Wear PPE? Occ	Wear PPE? Nev	PPE Under What Conditions	Training On-the-Job	Training Chemicals	Training PPE

OTHERS

Bill Mason 1B -44 (lead)
also @ CTL IV

Billy George → CTL IV

BNA0875910

HDMSe00247802

WHAT WE LEARNED FROM INTERVIEWS WITH EMPLOYEES?

Health & Safety

1. People feel good about health and safety practices of the company today (especially last 4-5 years). Some did mention the need to still improve training.

2. **Hydrazine**

The amount of exposure workers received may be greater than what records suggest. There was clearly movement of workers to various test stands over time as program needs and staffing levels changed. Mechanics (operations) are clearly the group who may have had the most exposure although individuals in the equipment labs probably also had similar exposures to test stand (propulsion test mechanics, proposion test technicians). The opportunities for exposure were greatest before and after tests from activities such as:

- cleaning and breakdown after tests
- "cutting" lines
- pumping fuel

3. **Asbestos**

People exposed to hydrazine did also work with asbestos:

- JP gaskets
- wires
- blankets
- insulation tape

4. **TCE**

Of all the chemicals worked with, exposure to TCE appears to be the most significant and memorable.

Chances are, if you were exposed to TCE you were also exposed to hydrazine and asbestos.

98rock.intvsum.wpd.August 27, 1998

Why Reference Comparisons are Important.

Michael Ginevan
risksciences.com, L.L.C.

At the last meeting at UCLA Hal Morgenstern suggested that their report would include no external comparisons. That is, they would not compare the mortality experience of the Rocketdyne chemical workers cohort with that expected from other large populations such as the NIOSH cohort used in the Rocketdyne radiation study, or the mortality experience of the DOE workers from the Comprehensive Epidemiologic Data Resource (CEDR). The position of the Rocketdyne expert panel is that such comparisons are vital to a complete understanding of the results of the Rocketdyne chemical workers study. However, at the meeting with UCLA, we did not make the case for such comparisons as fully as we could have. Figure 1, is an attempt to clearly illustrate the value of such comparisons.

In Figure 1 we show death rates for two similar study groups (Group 1 and Group 2) which are further divided into exposed and unexposed sub-groups. In group 1 the death rate from some disease of interest (say lung cancer) is 20 per 100,000 person-years in the unexposed sub-group and 40 per 100,000 person-years in the exposed sub-group. In group 2 the death rate from the same disease is 60 per 100,000 person years in the unexposed sub-group and 80 per 100,000 person years in the exposed sub-group. If these differences were reported only as rate-ratios or relative risks the relative risk in group 1 would be 40/20 or 2.00, while the relative risk in group 2 would be 80/60 or 1.33. Thus we would get the conclusion that exposure is more Arisky@ in group 1 than in group 2 because in group 1 the relative risk is higher than in group 2. Now, let us assume that we know that the person-years in each group is 100,000 evenly divided between exposed and unexposed. The number of cancer deaths expected in each subgroup is shown in Table 1.

Group, sub-group	Person-years (PY)	Rate per 100,000	Expected cases (PY x R)	Excess Cases
Group 1, unexposed	50,000	20	10	-.-
Group 1, exposed	50,000	40	20	10
Group 1, unexposed	50,000	60	30	-.-
Group 1, unexposed	50,000	80	40	10

When viewed this way, it is clear that the number of excess deaths expected in the exposed group is 10 in both groups (20 - 10, and 40 - 30). So in terms of excess cases of the disease of interest, the risks in the exposed populations of the two groups are equivalent. This shows that simple relative risk calculations can obscure important details.

Now, let us assume that we calculated expected disease rates for the two groups based on the person-years from the two groups and death rates from some large AReference@ cohort. Because we have assumed the two groups to be similar and to have the same number and distribution of person years, the expected death rate is 40 per 100,000 in both groups. When we compare this expectation to the observed rates, we see that in Group 1 the Aexposed@ rate is just equal to the rate expected on the basis of the AReference@ cohort, while the Aunexposed@ rate is only half what would be expected on the basis of the AReference@ population. In group 2, a quite different picture emerges. The Aunexposed@ rate is 1.5 times that expected on the basis of the AReference@ cohort, while the Aexposed@ rate is twice that expected on the basis of the AReference@ cohort.

This reference comparison changes our view of the two groups again. For Group 1, the question may not be Awhy is the exposed group elevated?@ but rather, Awhy is the unexposed group so low?@ For Group 2 one would note that both unexposed and exposed workers show elevated death rates relative to the Reference cohort and might conjecture that some exposure mis-classification has occurred. That is, in Group 2 it could be that the unexposed group included a substantial number of workers who were in fact exposed. If this is the case, the true relative risk of exposure in Group 2 might be very much larger than 1.33, and the actual excess risk of death from exposure could well be much larger in Group 2 than in Group 1. This is a complete reversal of the conclusion reached on the basis of relative risks.

This example shows why most occupational epidemiologists look at their data from multiple perspectives. Relative risk gives a feeling for how much disease rates have been multiplied, and is especially useful in identifying elevated risks in rare diseases. Absolute risk calculations (e.g. 20 excess cases per 100,000 person-years) are useful in identifying the most important threats to health (e.g. a relative risk of 5 in a disease with a baseline rate of 5 per 100,000 PY [20 excess cases per 100,000 py] is not nearly so serious as a relative risk 2 in a disease with a baseline rate of 100 per 100,000 PY [100 excess cases per 100,000 PY]). External comparisons provide perspective. If there is no overall disease excess when the overall study Group is compared to some appropriate Reference cohort, this result may inspire caution because it raises the question of whether the exposed workers are getting sick or the unexposed workers are exceptionally healthy. If, on the other hand, such a general comparison shows a pervasive elevation in disease risk, one might be concerned about exposure mis-classification, and suspect that adverse health effects were really occurring at a greater rate than the relative risk suggested. The important point is that there is no one correct way of looking at occupational epidemiology data. Multiple views are essential to a full understanding of the results of a given study.

③ SK
8-20-18

fuel RP(2), liquid oxygen
lubricants on bolts
silicone

When conducted — in control room, outside or
stand if pressurized

"Leak" → Drop liquid oxygen to pressure purge everything
you'd see plume come out if leak
"dump it" away into ditch
Dump for RP (each into end item tank) we weren't

Looking for leaks WAS OUTSIDE
into ditch

→ 1 hr or more
a couple of people

No PPE when checking for
leaks....

Not allowed to put on all

*Occasionally (All the time) would get a bucket of it (All the time)
to drop igniters into if they wouldn't completely expend
itself IN open all the time 3-4 a shift

- take out igniter throw in bucket of RP
- thread away bonds + gasket it
- wipe down with "Tri" trichloroethylene

It was terrible ... get buckets of it my hands would
turn white immerse hands in bucket all bits in then
put on rag to dry off

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(2) SK
8/24/16

Stand 1B - gas generator stand - installed gas generator ignitors
4 people
2 people
Bill Mason
↳ ran 1B
consoles

each crew same people

Other workers activities 7 different stands
running large gen. turbo pumps

Large instrumentation crew - wiring on stand vs hard plumbing
→ Not outside as much as Stan

Preservation of turbo pumps
materials that fluorescent liq leak system
talc apart locks feed system
* entry into LOX tanks (on east side)
Blow up of a turbo pump in Stand 2 before restart up needed
More full S.S. contained breathing
Wiring up nuts + bolts
Simulate F.I.
Out on stand - piping

Anytime you left control center (on 2nd floor of test stand - hard hat / safety

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8-20-98

Stan Kacin

Stvl Oct 1961 - Retired

2 different layoffs after 6½ yrs laid off 4 yrs 11 months

~~4 months (3 yrs)~~ worked another 6 month layoff

All employment was at Hill ~~with exception of~~ until Nov 1988

SSME

1961 CTL 2 about 1 year - "A" mechanic

CTL 4 (which is today STL 4) worked here until laid off 4 yrs 11 mo

loaned out to Coco construction & Chemicals every weekend for 4-5 Months

installed stainless steel instrumentation mechanic

worked in preservation (turbo, gas generators only at CTL 2 " " of turbo pumps often rent calibrated put special "Cosmoline" inside & item swirled around by hand, drained out with no left, dried → preservative (Cosmoline army used) runny oil, high vapor you swirled + it vaporizes [INSIDE building]

Every time smelled

"RAN stands" - assisted in running turbo pump

Temp stands - 3B - (never ran

installed pump into facility → block + tackle to bring

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SK
(5) P8 4

"Trik" machine - heated it condensed VAPOR
- Couple of inches in bottom of bucket
- Most of "Trik" went back into machine

In military duty some work at Huntsville Alabama
used Trik 3 yrs on test stands
Doesn't know anyone in military

Fluorescent material in Lox line was by incident
"New material" could fluoresce - silicon lubricant
Dumped entire 50,000 of Lox over side of hill

CTL 4 (STL 4) after 1 year in 5½ yrs
transferred
Mechanic Tech
Instrumentation class A
Instrumentation Tech
} How were these different
If tech you directed ~~mechanics~~ mechanics
In charge of stand

Module 3 at CTL 4 - walked on

Big difference - CTL 2 operational CTL 4 wasn't
trying to get operational
every tubing had to be run - -
Cleaning - everything evaporated
If you let sit it was clean

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Stew K.
PJ 5 8/20

Cleared with water
Alcohol Lox gas generator to create altitude
Lot of cleaning → with new stuff cleared with TnK
* 90% of stuff previously cleared + wrapped (we didn't clean again)
Our own weld shop may have cleared

When you first started at stands welding going on
Never hear a welder they would have contaminated by prop

Measure something Nutty it would fit into field location would
be near welder

'Lots of fuels' — Anatyn — hypergol igniters — rack
MMH
UDMH
Alcohol
RP2 and RP4

A lot of these fuels were there and we had to get rid of
them "de tank"
by gravity into drum or pressure into drum * This took
a couple of instances pumps or drums days
didn't use line
bigger than ½"
a couple of
months

1 time clean up → to get rid of fuels

Oxidizers - de-tank
hydrogen peroxide, Hydrazine (in little pond) — Not more than
tank lines (part little trenches) } got into pond get trails of H peroxide
dispose → No breathe PPE but slash guards

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SK
Pg 6
8/20

Cleaned up area
Put together
Flush tanks with water
flush oxidizer — Red fuming Nitric acid
Inhibiting Red fuming Nitric acid
Nitrogen Pentoxide

I really got into red fuming nitric tank "thank god not inhibited"
No valves, deactivated - 2" discharge line ~ 20 ft long
line shut off valve at tank couldn't get all of
Dumped to atmosphere as slow as could
Red cloud - splash marks yellow dots on skin
MINOR -

Another 5 years — Storable fuels — MMH primary fuel / hypergol
oxidizers — NTO

Splash guards
Suit up in grey suits as stand by

break a be nut until fluid came out (Breaking = piping to zero transducers
vs valves about) Took about 15 minutes
1 or 2 people usually
3 or 4 times a day.
later on kept stand tank entire week to
Mechanic Tech = crew 23 just as often

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B 7
SIC

cleaner operation ... Much less to clean at

Propens changed

ham - thru instrumentation never exposed
except tear out electronic cables from studs wired

Altitude chambers - always suck exhaust chambers back into
Wipe it down with tri
Alcohol cleaning

Lance Blew up → 1964

Rained on people at explosive facility ... with NTO

Handling materials training ★ really be careful with
Instruction on greylight suit - self contained
seldom used - on standby

if changing major LINE
learned alot when tore apart old facility, ...
pushing into barrels
tended to dump NTO ... too hard to put into sampling
if

Insultion -
at ETEC heating liquid sodium lines -
Knew it was asbestos ...

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S/C
PJ 8

If in acted area - just dust mask - } 12 or 15 years
If wasn't working saw dust
When at ETEC MNT radiation bldg
- Stan - not too many

What other JOBS
BRAVO - deactivation
CUCU - weekends build up
Instrument lab liq - calibration (ETEC)
CBI construction dept - wrote procedures
field installation will turn apart old
Nack test stand on other side of Bldg 38 - clean lab, mercury in sewer piping
- ducted piping
coal trip + STL
Liquid sodium by products hit air
argon in with lot of welding - SPIF 463

Bill Mason
Billy George - just retired from equip lab

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HDMSe00247813

8-20-98

Didn't get letter

Ed Embry
Don Pfremmer

Ed

a) 1958 started — Alfa large engine test
no idea of classification was "mechanic"
maybe propulsion

about 2 years

b) Coco — large engine test — couple of years

c) ST-L-4 (was called CTL 4) small engine space engines
Propellant systems

Still mechanic

d) CHTL (combustion heat transfer lab) ~~where~~
same kind of place
had a research dept. worked at CHTL, APTF, NAKA
same group
} 4-5 years

e) CHTL changed to LETF (Lasers) 4-5 yrs then closed down — 3-4 areas the same group, same supervisor, crew changed slightly

CTL3 — Large-scale Laser work until closed down

AIPWA — 1 year as mechanic
asked for transfer into equip. lab where currently is (last 10-11 yrs)

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(2)

Don: retired 1997

Started 1958 "C" Mechanic Boiler Mechanic

Equipment Lab acid bay cleaning 5 components, valves

1 year learned acid cleaning (outside) large big stuff outside

Small hand valves, flex hoses (inside)

B Mechanic - 1959 except for making stand calls*

A Mechanic - inside outside

Lead Man (in charge of A, B, C)

cleaning + assembling valves - inside cleaning booths

1960's - Layoff occured (transferred) to El Segundo (Imperial)

Master Layout technician making prints 1 yr

Recalled in 1961 to Equip. Lab - same work inside

1961 - 1976 until another layoff

Ed, Don went to Canoga to "Pump Room"

only there a few months to equip. lab

Similar work than post 1976 - Manager 15-16 yrs around 1980-81

"High Bay" - other end of equip. lab

work on 18" ball valves / cleaning surface / assembly

test

Some outside work on tests (stand calls)

all the time on & off

As manager assigned to equip lab in charge of ~20+ people

1st Shift

Don - Acid Bay worked with TCE as solvent

alcohol, acetone

Clean + flush → stainless steel ducting acid clean it

(depending on service Lox, flame - lots years)

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BNA08757923

HDMSe00247815

(3)

flayed up + pumped = Vats with Lids (similar to acid Bay today but no aqueous cleaners)

Cleaning Inside 1958 →

hoses, small valves, large ducting, tubing

TCE was main solvent - not sure when they stopped using it

"Trike" → TCE - 15 or 20 yrs (mid late 70's)

Trichloroethylene

facility valves on stands used TCE

large equip - flayed, pumped to duct to fill up
drain acid return rinse with DI H2O
then gravity acid (HNO3) drain, pump back to VAT rinse

To dry - it used TCE

A lot of went into drain - BULK 2000 gal tank

gravity feed fill pail - sometimes could pump or slushed up

tried to collect but in a lot of

No breathing equip.

Coveralls, boots, gloves rubber - Everyone tended to wear gloves

You did get exposed neck, hands - some small amount 1-2 oz

Inside small parts cleaning - everyone had gloves but tended to not always wear gloves

Ed - Always breathing fumes - that stuff is powerful

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(4) Ed & Don

It's strong -, bad - ⊖ bad for throat Some people
SMELL mostly
get it in eyes burning (4-5 times in career)
25 to didn't ⊖ wear gloves
Ed - breathing it NO MSDS sheets if you look up it says
Inhaling hasn't good for you
Don MSDS - only 5-10yrs ago
Ed last 4-5 yrs really emphasized
Never wore respirator for TCE (either of them)
Ed - when he went back to alpha - (~10 or 11 years ago)
they were given a mask to wear for flushing large engines
canister type, gloves - Some didn't wear - but majority tried
If you got it on your hands often hands turned white
periodically
taking apart, cleaning, reassemble + tested with inspectn
originally someone not tested - until) late 60's another person tested
Equipment lab people - did the same thing
A large part of day was actually spent in cleaning - said about ½ day
brushing it in booth or outside booths had ventilation

"Stand Calls"

If leaking packing on valve GM-2, helium, LN2
change switch, adjust valve - not too much TCE mostly cryogenics

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HDMSe00247817

(5)

Valve crews
People in equipment lab — pump crews
outside crews

Valve for Service with peeking in it or disassembled it might be

Did you ever smell hydrazine - more sweet smell (faint wiff)

Stuff drip on lenolium - catch on fire occassionally

Short span to dissassemble if you smelled you took to sink in pail of water (face shield rubber gloves)

Ed

Alpha test stand install + test, remove

Kerosene, RPI liquid O_2

GN2 Helium

TCE for flushing, cleaning

3 crews instdl engine

flush with TCE - loop closed system under pressure

drain it - take out 4 plugs drain it (standing by it

5-10 minutes to drain ~ ½ he's dry

Similar flushing after test again ½ he

1 crew - set up
run
clean

dropping fuel -

pulling an engine - could get fuel on it (residue fuel)

Always smelled it ... (fuel)

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BNA08757926

HDMSe00247818

Pg 7

Ed/Don

Working the systems - tubing - breaking into item to install hardware
change instrumentation valves

Sample hydrazine - took it to send to lab
15 minutes but
also this was a little bit more of a closed system
aspirate caused vacuum

At ~~STRV~~ STL4 - exposed ohes ~ day to do stuff

CHTL - Florine
MMH
hydrazine - was told to handle it more carefully by others
to be
It's better today - cleaned it up
concentration

Ed Asbestos Issue is whether those people exposed to hydrazine also inhaled asbestos

No one told us ... I was affected

Alpha Sustainer engine had to be wrapped with asbestos sheeting
every engine putting on or taking off
This was only ~~engines~~ engine the atlas sustainer

CHTL - used asbestos to wrap insulation

Production Area - handling little spare engines + tanks hardware

Research } Both hydrazine, asbestos
CHTL }

40-50 people

Maybe

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Pg 8
Ed/Dow

(JM)

Most gaskets had asbestos at steads - man gasket material w/o asbestos
these gaskets were serviced after leak testing
Everyone was making gaskets in equipment lab.
gasket cutter -

Other chemicals
Acetone
~~Freon~~ freon
alcohol

Dow - Lockheed layout no chemicals
Ed - Service (Navy) technician - film developing - chemicals in vats

Training cryogenic, high pressure rigging
hrs training - 10 yrs or so been good
"Loose" -

Dowty - hot oil
Acid smell
SOAP tank - "really strong"

Kim - Do you still smell MNH when valves come in
Ed - flushing is better today but valve
cradles, crevices, peeling - can't get rid of until you
disassemble (not quite as strong a smell)

6

Jim Lang

8/20/98

Began Dec. 30 1963 AI at Desoto 8 mo

then to Hill Nuclear 20 yrs in Hot cell bldg 55, plutonium almost every nuclear

14 yrs ago transfred to propulsion side (1984)

1986 head count dropped (challenger)

1988-90 build up

90-95 slim

95 → building up

In 1965 laid off — came back in 1966

laid off 1968 returned Jan 1969

1984 — APTF } Manager supervised technicans
STL 4 } work assignments, admin

Instrumentations — electrical, data aquasn, elrctrical

Operations people — primarily plumbers, assm (test stand mechanics

Currently Jim is staff advisor

APTF — Tested with variety of propellants NTO, MMH (storables) & cryogenics

STL 4 — C

a) Build up — testing & co } plumbers, propellant lines, vents, controls — contact with almost always had PPE — Class A or B

not encapsulated but SCBA, hood, suit hot sealed ~~sto~~ gaylock coveralls

one person took complete with working on line got opened up

rarely → two type of incident

burns on skin

Today — fully encapsulated suits — changed in early 19

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- walking on lines, reconfigure test stand could smell "OH SURE"

b) testing
Everyone evacuate area in block house or control
prior to pressurizing line
NO exposure

c) change stand, retest NTO / MMH
vent down - to hill top stacks or into ponds at facility
no one out in test areas closest people 100 yds or several
tearing down / reconfiguring - opportunity for exposure
class A - was coveralls
hood
connected
By 1984 wearing scuba for
breaking into lines

Solvents
Freon (TCA) TCE gone by 1984
washing / cleaning - wipe cleaning
flush cleaning of tubing buckets submerged parts
gloves only sometimes
Squeeze bottles - flush + wipe

APTF - Used a lot of really toxic stuff
Fluorinated compds
pre 1984 Compound A - chlorine pentafluoride
CIFs
Penta + Di boreens
florine still in use until 2-3 years ago
Big push came after the accident

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We used asbestos as insulation for a lot of things wrapping lines
by 1984 - most usuage - in 1984
instrumentation mechanic - wiring
operations mechanic - gasket
asbestos blankets - welders used - , used all over the place
according to Jim
insulating lines; wires

Heaters for NTD
"off the wall - people who worked extremely likely to come
in contact with exposure
likely exposure - tearing it apart
Asbestos material wrapped around lines
*YES

When did asbestos start to go away - after 1984 ...
gradual except still have asbestos with asphalt tile
practices of using asbestos except for gaskets still in use

Moved people - on day-to-day - hourly basis ...
List of names where were they
APTF & STLY - switched around alot
ALPHA / BRAVO - RP (hydrocarbon) some toxic testing (Jim heard this)
COCO - went to alpha/Bravo as necessary

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page 4
Jim Lang
8-20-98

Stan Bell – talk with he worked in early days

Would have been unusual pre 1980s to switch from Rad to radiation
In early 1970's propulsion people (shut-down) of apollo went to radiation (10-15 people)

*As likely if not more likely to him asbestos exposure

What stories

MMH – Fishy smell
When doing stoichiometric testing – smell NTO –
fairly frequently NTO, MMH – not unusual to smell
Pit 3 at APTF – still like this in 1984 – started tightening up trying to find leaks (could smell at ppm)

STL 4 – 6-8 one shift } 1984 still very busy
APTF – 15 operations

Next NTO daily on hill top stacks
Stories of loading propellants with bucket + funnel

Pumping – Guys working in a cloud of material
this practice continued until early 1990's...?

Today – slim to none
higher level of protection
more controlled environment

Bought monitors in 1980's from Germany but they didn't work

→ Stan Bell other people to talk with...

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Rocky

Barrel wasn't pressurized weep hole in pump
normally put vinyl around 1

TRAINING operation

~1 hour

after test

Purge system -
storage (250 gals) → run tank (20 gals
→ with GN_2, alcohol
vented to hill
water sump

~~Rocket~~

Trichloroethylene

Instrumentation Mechanic - if you broke into system you had to break into line if transducers daily is that this happened

Very safety conscious in 1957 → 70's late 60's
training
breathing equipment NTO
hydrazine - avoid contact
Look at for "orange cloud" (NTO) which mean it was poop
got out of the way.
If foggy morning could feel
Large engine test areas - control mechanic
You knew what you were doing

N

Then Rockwell came into picture in 1970 &
1968 → North American bought by Rockwell

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Bob

People came in but didn't get proper training (1968 - until 1981) until Safety rep established
Bob felt strongly that Safety suffered, less training 'Monkey See Monkey do)
training is only back more recently 1990+).
official training for
Safety meetings 1x month, reps IN each area

1968 - 686 plus people eligible to vote
1970 went down to < 200 people

No training program whatever they
Instrumentation people removed from any function handling propellants (controls)

Rocky → People who came into area didn't get

4160

B { Components area - outside in cell) CTL operator
people in control centers in same environment as operators

Research was bed area → 15 instrumentation
test 25 mechanical operators
research area

Rocky

{ Make gaskets - in all days used JM (asbestos)
clean gaskets
Most INSulation used had asbestos - had to put on
take off, etc.
Sheet asbestos all the time Welder - any time in your area try bought blanket

Page 6

8-21-98

Bob / Rocky

How often were you crand welders? "All the time"

cleaning Operations

Run rag through it bucket out of 55 gal drum
bucket or bread pan
gloves were furnished but many people didn't use it

In research and equipment lab

components + experimental no controls
about 30 gal tank heat up to 150° used hot TCE to clean
to open container of nitric acid
Any valves got sent that had residue

Movement of people - 1967/68 people moved more frequently

Alpha Bravo may not have rotated as much as other people
it was a more stable work environment

COCO - some management who moved their people

research - people

** Rocky + Bob will go back to list they have and try + recreate locations

INCIDENTS

There would be an announcement
Hydrazine was in a lot of areas where "science" projects

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8-21-98

Bob / Rocky

Kim clarified what was in Delta area (Delta 1, 2
Delta 3 - storable

Rocky - CTL 4
Guidance engine tested chamber was made out of beryllium
machining mostly in Canoga

Preemployment - Lockheed Rocky worked MEK
Bob - construction no chemicals

Not sure where info came from - not very comprehensive Bob
the rad was more comprehensive

In early days more people went from Rocketdyne to Nuclear

Freon used to clean ~~LOX~~ LOX system at CTL 4
in clean room (got headache)

Concern - That there is lots of intent but still not
enough training in place
** still need more training upstream

Who they interviewed
how they interviewed
what they did

They don't feel report is accurate
UCLA → they concentrated on Red side

We're talking about chemical exposures - the study should have
been

You didn't know -- you p

Didn't cover chemicals - -

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8-21-98
pg 1

Les Rogers
Jim Mitchell - went to meeting with UCLA didn't like report

↳ he was interviewed by UCLA

Les Rogers 7/5/56 - Bldg 325 NAKA "C" Mechanic
Building solid propellant igniters

In and out for several years building igniters

~~[illegible]~~

1959 - mixing chemicals testing solid propellant motors
building igniters

Upper Research — tunnel area Mechanic Technician
Happy Valley

IN and out moved to liquids PRA (lower research)
plumbing - tubing supporting test stand buildups

would go back to NAKA

In 1960's started work at NAN stand

LETF - Combustion Heat

1964 - Compound A did build up

Then to engineering chemistry lab - testing small liquid engines

ECL area in early 70's spent a lot of time but "in and out"

Came back to APTF — as technician in Mid 70's

explosives area

1980's all over including STL 4 - few months

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Pg 2
Les/Jim
3/21/96

In 1969 - big layoff not many mechanics around so they got shifted all

Jim M. 6/26/61 - Engineer in training
Eng. training Program (2 Months gen gen
2 months CTL 2
turbine unit -
J2 Lox & fuel nozzles - CTL 1

Test engineer March 1962 CTL2 until 6/30/66
In 2 weeks at Delta
CTL 3 - Test eng Mod 4 until laid off april 1969
worked Mod 1 as
Laid off 3 weeks switched to AI but not in radiation area
until 1977-78 transferred to Hanford, WASH
as design eng (film badge radiation)
Left 6/30/87 - to APTF To June 1990 ~~Feb~~ 1992
then back to old AI prop new production reactor tritium
then stopped
Bldg 20 - helped tear down more film badges
Retired JAN 31, 1994 now back

Les - what did you work with
butyl acetate
TCE,
Cleaning of hardware put it bucket + wash it more
Slaves
Worked with upper research Hydrazine, MMH, NTO alot

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Page 3
1993
Les

Would pump MMH - glayco
NTO closed system

{Tear down / disassemble, clean it
Smell it or see it

Seals - K seal
O Ring
JM gaskets →

Les has worked with everything SAME engineers
technicians - in test stand next to guy, tear hard ware down
build up }
tear dwn }.
when test going on other mechanics + technicans
Les had own cutting torch, weld
Research was more self sufficient they built everything
welded
~~Research was a~~
Safety / Health Training:
→ Always safety - Les has been safety man for the area
Rotation was common -

Incidents

Got Azide power on skin get headache, drops blood pressure
chemical walk at ECL
headache + weak (is what made him think b
went to see Nurse

Florine Gas - we were forever fooling around with that stuff -- smelled it IN air

Les - You were told to wear gloves but sometimes he's didn't want to because he could feel "leak"

STL 4 was where he recalled having most hydrazine smell it was in a tank, capsule altitude chamber

Methylene Chloride
~~Beer~~ - worked with barrels, barrels & barrels as a carrier in ETC but wore gloves, no mask

Built set up for labs

Beryllium - Powder form in Solid Propellant Motor]

Most frequent — Methylene Chloride
Acetone
TCE
TCA
acids

Jim Mitchell

CTL 2 - LOX, RP - in tank
TCE, H_2 hydrogen peroxide
alcohol
↙ used to clean

] Test engineer

I understand it was addictive — they'd get withdrawal

Delta — LOX, H_2

CTL III — LOX, H_2, igniter CTF suit up in full gray lox

Every stand had JM gasket material - sheets of stuff
Hand cut it with gasket cutter in workshop ~~office~~
near test stand

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8-21-98

Jim Mitchell - Rocketdyne went down in 1969-70 which is the same time that AI side was building up so design people went over to AI not so much test people

Les - In 1978 less than 600 people on SSFL

I asked if anyone worked with Benzene - Les yes ECL area stinks, smells like shoe polish

Les - said that more people moved around, less training did occur in the 70's

Jim has list of all training he went through in the 60's

Both Les & Jim concerned about not enough training today

- Came to Rocketdyne right after High School

I asked about smoking history

Les said just about everyone smoked in early days would smoke in lunch area, at desks

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EMERGENCY ACTION
INVOLVING
DANGEROUS CHEMICALS

NOTIFY PROTECTIVE SERVICES
SSFL 5333

CHEMICAL	IF THIS HAPPENS	DO THIS
COMMON FLAMMABLE LIQUIDS ACETONE, ALCOHOL, ACETATE, BENZENE, JET FUELS, HEPTANE, THINNERS, PENTANE, HEXANE, GASOLINE, MEK, STOD SOLV, NAPHTHA, TOLUENE, KEROSENE	FIRE	USE WATER SPRAY OR FOG DRY CHEMICAL CO_2 PROTECT OTHER EXPOSURES
	SPILLS LEAKS	SHUT OFF SOURCE, WASH DOWN AREA WITH WATER
TOXIC FLAMMABLE LIQUIDS ETHER, UDMH, MMH, HYDRAZINE FUELS, HYDRAZINE AD MIXES	FIRE	USE WATER SPRAY, FOG PROTECT EXPOSURES EVACUATE PERSONNEL TO SAFE AREA USE FULL PROTECTIVE CLOTHING SELF CONTAINED BREATHING EQUIPMENT
	PERSONNEL EXPOSURE	UNTIL COMPANY AMBULANCE ARRIVES: WASH EYES AND/OR EXPOSED AREAS OF SKIN WITH WATER
	SPILLS LEAKS	SHUT OFF SOURCE EVACUATE PERSONNEL TO SAFE AREA USE PROTECTIVE CLOTHING
PYROPHORIC MATERIALS PENTABORANE, DIBORANE, TEA, TEB	FIRE	ALLOW TO DISSIPATE. PROTECT EXPOSURES USE SELF-CONTAINED BREATHING APPARATUS FULL PROTECTIVE CLOTHING
	PERSONNEL EXPOSURE	UNTIL COMPANY AMBULANCE ARRIVES: WASH EYES AND/OR EXPOSED SKIN AREAS WITH WATER
	SPILLS LEAKS	SHUT OFF SUPPLY IF POSSIBLE EVACUATE PERSONNEL
ACIDS COMMON ACETIC, NITRIC, SULFURIC, PHOSPHORIC, HYDROCHLORIC, HYDROFLUORIC, PERCHLORIC 72%, SODIUM HYDROXIDE	FIRE	USE WATER. EVACUATE PERSONNEL TO SAFE AREA USE FULL PROTECTIVE CLOTHING SELF-CONTAINED BREATHING EQUIPMENT. PROTECT OTHER EXPOSURES KEEP CONTAINERS COOL
	PERSONNEL EXPOSURE	UNTIL COMPANY AMBULANCE ARRIVES: WASH EYES AND/OR EXPOSED AREAS OF SKIN WITH WATER.
OXIDIZERS TOXIC HYDROGEN PEROXIDE, IODINE PENTOXIDE, IRFNA, NTO RFNA	SPILLS LEAKS	SHUT OFF SOURCE. WASH DOWN AREA WITH WATER USE PROTECTIVE CLOTHING
ALKALI METALS CESIUM, LITHIUM, POTASSIUM, RUBIDIUM, SODIUM, NAK	FIRE	DO NOT USE WATER. USE DRY CHEMICAL EXTINGUISHER MATERIAL REMOVE TO OUTSIDE IF POSSIBLE. PROTECT EXPOSURES
	SPILLS LEAKS	STOP FLOW OF LIQUIDS IF POSSIBLE. COVER SPILLAGE WITH DRY CHEMICAL POWDER. DO NOT USE DAMP COVER MATERIAL
COMBUSTIBLE SOLIDS ALUMINUM POWDER, MAGNESIUM, TITANIUM, ZIRCONIUM, BERYLLIUM	FIRE	DO NOT USE WATER USE SPECIAL DRY CHEMICAL EXTINGUISHING AGENT METAL X G I POWDER
	CHIPS DUST	MAINTAIN CLEAN AREA OF WORK

CHEMICAL	IF THIS HAPPENS	DO THIS
GASES FLAMMABLE HYDROGEN, ACETYLENE, OXYGEN, BUTANE, PROPANE, NATURAL GAS, M.A.P.P., METHYLAMINE	FIRE	DO NOT TOTALLY EXTINGUISH FIRE. ALLOW FIRE TO BURN OUT USE WATER SPRAY OR FOG EVACUATE PERSONNEL TO SAFE AREA SHUT OFF SOURCES OF IGNITION. PROTECT EXPOSURES.
	SPILLS LEAKS	SHUT OFF SOURCE OF SUPPLY
GASES NONFLAMMABLE AMMONIA, ARGON CO_2, HELIUM-NITROGEN, SULFURHEXAFLUORIDE	FIRE	NO FIRE HAZARD
	PERSONNEL EXPOSURE	UNTIL COMPANY AMBULANCE ARRIVES: WASH EYES AND/OR EXPOSED AREAS OF SKIN WITH WATER
	SPILLS LEAKS	SHUT OFF SUPPLY, VENTILATE EVACUATE PERSONNEL USE SELF CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING
GASES TOXIC CTF, NTF, FLUORINE, TETRAFLUOROHYDRAZINE, BROMINEPENTAFLUORIDE, GPF, CHLORINE	FIRE	ALLOW MATERIAL TO DISSIPATE USE SELF-CONTAINED AIR BREATHING EQUIPMENT FULL PROTECTIVE CLOTHING.
	PERSONNEL EXPOSURE	UNTIL COMPANY AMBULANCE ARRIVES: WASH EYES AND/OR EXPOSED AREAS OF SKIN WITH WATER
	SPILLS LEAKS	SHUT OFF SOURCE IF POSSIBLE EVACUATE PERSONNEL
EXPLOSIVE SOLIDS PICRIC ACID, TNT, PETN, RDX, DNT, COMP. C-C3-C4-B, NITROCELLULOSE, HYDRAZINE NITRATE, HYDRAZINE NITROFORM, BLACK POWDER, LEAD AZIDE, BLASTING CAPS, LITHIUM PERCHLORATE, SOLID PROPELLANTS, FLARE MIXES, SPGG, PERCHLORATES/NITRATES	FIRE	DO NOT FIGHT FIRES INVOLVING THESE MATERIALS EVACUATE PERSONNEL
	SPILLS LEAKS	EVACUATE PERSONNEL REMOVE LEAKING PACKAGES TO AN APPROVED LOCATION CLEAN UP BY DILUTING WITH APPROVED METHODS
EXPLOSIVE LIQUIDS NITROGLYCERIN, PICRIC ACID, PLASTISCNITRO-CELLULOSE		
EXPLOSIVE PYROTECHNIC DEVICES CONAX VALVES, ELECTRIC SQUIBS, ELECTRIC IGNITERS, IGNITION DEVICES, POWER CARTRIDGES	FIRE	WATER SPRAY OR FOG EVACUATE PERSONNEL PROTECT EXPOSURE
MISCELLANEOUS MATERIALS PYRO DEVICES		

FORM 412-T-2

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CONFIDENTIAL LEVEL I - UNDER PROTECTIVE ORDER,
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1968

JOB CODES, JOB TITLES AND LABOR GRADES

Code	Title	Rate Range	LG
4003	Air Conditioning & Refrigeration Mechanic		*
4163	Automotive Mechanic—Senior		*
4164	Automotive Mechanic		10
4423	Crater & Packer—Senior		8
4424	Crater & Packer		5
2703	Data Technician—Electrical/Electronic		17
2704	Data Mechanic—Electrical/Electronic		12
4553	Dispatcher—Motor Transportation, Senior		*
9023	Driver—Truck, Combination		*
9024	Driver		*
4593	Expediter—Senior		11
4594	Expediter		6
4923	Heat Treater—Steel, Senior		14
4924	Heat Treater—Steel		11
4853	Industrial Carpenter—Senior		*
4854	Industrial Carpenter		*
5873	Industrial Painter—Senior		*
5874	Industrial Painter		*
5093	Inspector—Machined Parts, Senior		16
5094	Inspector—Machined Parts		11
5143	Inspector—Outside Production		17
9123	Inspector—Radioactive Isotope		16

Code	Title	Rate Range	LG
3473	Inspector—Radiographic, Senior		15
3474	Inspector—Radiographic		10
9073	Inspector—Reactor Assembly, Senior		17
9074	Inspector—Reactor Assembly		12
5183	Inspector—Receiving Precision		16
5173	Inspector—Receiving, Senior		10
5174	Inspector—Receiving		5
5203	Inspector—Shipping-Major Items		11
5204	Inspector—Shipping		6
3643	Inspector—Ultrasonic		12
4443	Inspector—Ultrasonic—Precision		16
6433	Instrument Technician-Electronics		17
1/643M	Instrument Technician—Electronics		M
272T	Instrumentation Mechanic—Propulsion Research, Senior		*
2724	Instrumentation Mechanic—Propulsion Research		12
533T	Instrumentation Mechanic—Propulsion Test, Senior		*
5334	Instrumentation Mechanic—Propulsion Test		12
1/533K	Instrumentation Mechanic—Propulsion Test, Senior		K
1/533G	Instrumentation Mechanic—Propulsion Test		G
271T	Instrumentation Technician—Propulsion Research		18

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1968

Code	Title	Rate Range	LG
954T	Instrumentation Technician—Propulsion Test		18
5263	Janitor		2
3523	Laboratory Technician—Fluid Systems		17
9353	Laboratory Assistant		6
5313	Lathe Machinist		16
5343	Lift Truck Operator—Senior		8
5344	Lift Truck Operator		4
5403	Machinist—Bench, Senior		9
5404	Machinist—Bench		5
4813	Machinist—Engineering Test, Senior		17
4814	Machinist—Engineering Test		11
6033	Maintenance Construction Mechanic—Senior		*
6034	Maintenance Construction Mechanic		10
5483	Maintenance Mechanic—Senior		*
5484	Maintenance Mechanic		10
5493	Maintenance Oiler		5
5523	Maintenance Utility Worker		4
9813	Material Procurement Expediter—Senior		13
9814	Material Procurement Expediter		8
5563	Mechanic—AER Laboratory, Senior		17
5564	Mechanic—AER Laboratory		12

Code	Title	Rate Range	LG
563T	Mechanic—Engineering Propulsion Test, Senior		*
5634	Mechanic—Engineering Propulsion Test		12
1/563K	Mechanic—Engineering Propulsion Test, Senior		K
1/563G	Mechanic—Engineering Propulsion Test		G
9483	Mechanic—Engineering Test Equipment, Senior		15
9484	Mechanic—Engineering Test Equipment		12
9553	Mechanic—Instrumentation & Standards, Senior		13
9554	Mechanic—Instrumentation & Standards		6
274T	Mechanic—Propulsion Research, Senior		*
2744	Mechanic—Propulsion Research		12
5663	Metal Fitter—Experimental & Developmental		14
5703	Milling Machine Machinist		16
5793	Office Equipment Mechanic—Senior		14
5794	Office Equipment Mechanic		9
5953	Plumbing & Pipefitting Mechanic—Senior		*
5954	Plumbing & Pipefitting Mechanic		10
923T	Propulsion Test Inspector—Senior		18
9234	Propulsion Test Inspector		12
6183	Saw Operator—Senior		7
6184	Saw Operator		4

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HDMSe0024783

CODE	TITLE	RATE RANGE	LG
4363	Service Mechanic—Electronic Instruments, Senior		17
4364	Service Mechanic—Electronic Instruments		13
2/3583	Stock Clerk—Senior		6
2/3584	Stock Clerk		2
945T	Technician—Digital Instrumentation		18
644T	Technician—Engineering Propulsion Test		18
1/644M	Technician—Engineering Propulsion Test		M
9423	Technician—High Temperature Component Development		17
996T	Technician—Instrumentation & Standards		18
273T	Technician—Propulsion Research		18
6493	Tool Crib Attendant—Cutting & Hand, Senior		6
6494	Tool Crib Attendant—Cutting & Hand		3
6923	Utility Worker—Machine Shop		2

1/For Use At Edwards Field Laboratory Only.

2/For Use At Edwards Field Laboratory and Santa Susana Field Laboratory.

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United States District Court for the Central District of California, No. CV 97-1554

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CONFIDENTIAL LEVEL I - UNDER PROTECTIVE ORDER,
United States District Court for the Central District of California, No. CV 97-1554

1990

JOB CODES, JOB TITLES, LABOR GRADES AND RATE RANGES
UAW LOCAL 1519 SANTA SUSANA

Code	Title	Lg Max	Rate Range Eff. 7/7/90	Rate Range Eff. 7/6/91
4003	Air Conditioning & Refrigeration Mechanic	16	14.64-17.94	15.21-18.51
4163	Automotive Mechanic-Senior	14	14.01-17.26	14.58-17.83
4164	Automotive Mechanic	10	13.29-16.54	13.80-17.05
7053	Crater & Packer (4)	8	7.65-16.16	7.65-16.67
4553	Dispatcher-Motor Transportation	15	14.38-17.68	14.95-18.25
9023	Driver-Truck, Combination	13	13.88-17.13	14.45-17.70
9024	Driver	11	13.55-16.70	14.06-17.21
3663	Electrical Installation Mechanic (6)	10	8.40-16.54	8.40-17.05
5063	Electronic Assembler-Senior	7	9.97-15.73	9.97-16.08
5064	Electronic Assembler (3)	4	7.25-15.37	7.25-15.72
9363	Electronic Test Equipment Mechanic	12	13.77-17.02	14.34-17.59
5113	Electronic Test Mechanic	12	13.77-17.02	14.34-17.59
2903	Environmental/Hazardous Waste Technician	16	14.64-17.94	15.21-18.51
4593	Expediter-Senior	11	13.55-16.70	14.06-17.21
1/9753	Experimental Electromechanical Technician	18	15.20-18.55	15.82-19.17
4594	Expediter	6	8.40-15.62	8.40-15.97
4693	Final Assembly Checkout Electrician	14	14.01-17.26	14.58-17.83
9613	Final Assembly Checkout Mechanic-Rocket Engines	14	14.01-17.26	14.58-17.83
4853	Industrial Carpenter-Senior	15	14.38-17.68	14.95-18.25
4854	Industrial Carpenter	11	13.55-16.70	14.06-17.21
5873	Industrial Painter-Senior	14	14.01-17.26	14.58-17.83
5874	Industrial Painter	10	13.29-16.54	13.80-17.05
3573	Inspector-Electronic Testing (12)	15	13.77-17.68	14.95-18.25
3323	Inspector-Major Electronic Systems	17	15.01-18.36	15.58-18.93
5153	Inspector Precision Assembly, Sr. (11)	14	13.45-17.26	14.06-17.83
5154	Inspector Precision Assembly	8	12.59-16.16	13.10-16.67
9123	Inspector-Radioactive Isotope	16	14.64-17.94	15.21-18.51
3473	Inspector-Radiographic, Senior	15	14.38-17.68	14.95-18.25
3474	Inspector-Radiographic	10	13.29-16.54	13.80-17.05
9073	Inspector-Reactor Assembly, Senior	17	15.01-18.36	15.58-18.93
9074	Inspector-Reactor Assembly	12	13.77-17.02	14.34-17.59

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Code	Title	Lg Max	Rate Range Eff. 7/7/90	Rate Range Eff. 7/6/91
7293	Inspector-Receiving (5)	10	8.05-16.54	8.05-17.05
7303	Inspector-Shipping (6)	11	8.40-16.70	8.40-17.21
5073	Inspector-Utility	3	7.25-15.27	7.25-15.62
5263	Janitor	2	6.80-15.20	6.80-15.55
5313	Lathe Machinist	16	14.64-17.94	15.21-18.51
5343	Lift Truck Operator-Senior	8	12.59-16.16	13.10-16.67
5344	Lift Truck Operator	4	7.65-15.37	7.65-15.72
4813	Machinist-Engineering Test, Senior	17	15.01-18.36	15.58-18.93
4814	Machinist-Engineering Test	11	13.55-16.70	14.06-17.21
6033	Maintenance Construction Mechanic-Senior	16	14.64-17.94	15.21-18.51
6034	Maintenance Construction Mechanic	10	13.29-16.54	13.80-17.05
5483	Maintenance Mechanic-Senior	16	14.64-17.94	15.21-18.51
5484	Maintenance Mechanic	10	13.29-16.54	13.80-17.05
7383	Maintenance Utility Worker (3)	5	7.25-15.48	7.25-15.83
9813	Material Procurement Expediter---Senior	13	13.88-17.13	14.45-17.70
9814	Material Procurement Expediter	8	12.59-16.16	13.10-16.67

9483	Mechanic-Engineering Test Equipment, Senior	17	15.01-18.36	15.58-18.93
9484	Mechanic-Engineering Test Equipment	12	13.77-17.02	14.34-17.59
9553	Mechanic-Instrumentation & Standards, Senior	13	13.88-17.13	14.45-17.70
9554	Mechanic-Instrumentation & Standards	6	8.40-15.62	8.40-15.97
5883	Mechanic-Nuclear/Liquid Metals Research, Senior	18	15.75-18.55	16.37-19.17
5884	Mechanic-Nuclear/Liquid Metals Research	*	14.57-17.32	15.19-17.94
4573	Metal Fitter-Field Test Operations, Senior	15	14.38-17.68	14.95-18.25
4574	Metal Fitter-Field Test Operations (6)	10	8.40-16.54	8.40-17.05
5703	Milling Machine Machinist	16	14.64-17.94	15.21-18.51
7443	Mockup Mechanic-Electrical and Electronic (10)	16	13.29-17.94	13.80-18.51
3823	Molder-Protective Components	4	7.65-15.37	7.65-15.72
6353	Nuclear/Liquid Metals Research Worker	*	13.65-16.45	14.27-17.07
5793	Office Equipment Mechanic—Senior (14)	16	14.01-17.26	14.58-18.51
5794	Office Equipment Mechanic	9	13.00-16.35	13.51-16.86
5953	Plumbing & Pipefitting Mechanic—Senior	16	14.64-17.94	15.21-18.51
5954	Plumbing & Pipefitting Mechanic	10	13.29-16.54	13.80-17.05
7533	Propulsion Products Assembler..(6)	10	8.40-16.54	8.40-17.05

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Code	Title	Lg Max	Rate Range Eff. 7/7/90	Rate Range Eff. 7/6/91
944T	Propulsion Systems Technician—Instrumentation	18	15.75-18.55	16.37-19.17
9444	Propulsion Systems Mechanic—Instrumentation	*	13.83-17.83	14.45-18.45
947T	Propulsion Systems Technician—Operations	18	15.75-18.55	16.37-19.17
9474	Propulsion Systems Mechanic—Operations	*	13.83-17.83	14.45-18.45
923T	Propulsion Test Inspector—Senior	18	15.20-18.55	15.82-19.17
9234	Propulsion Test Inspector	12	13.77-17.02	14.34-17.59
7593	Service Mechanic-Electronic Instruments (13)	17	13.88-18.36	14.45-18.93
7603	Service Mechanic-Mechanical Instruments (11)	15	13.45-17.68	14.06-18.25
7653	Stock Clerk (2)	6	6.80-15.20	6.80-15.97
945T	Technician-Digital Instrumentation	18	15.20-18.55	15.82-19.17
996T	Technician-Instrumentation & Standards	18	15.20-18.55	15.82-19.17
6803	Thermal Bonding Machine Operator	5	8.05-15.48	8.05-15.83
7713	Tool Crib Attendant-Cutting & Hand (3)	6	7.25-15.27	7.25-15.97
6923	Utility Worker-Machine Shop	2	6.80-15.20	6.80-15.55

* Special Rate Range
1/ For Use At Edwards Field Laboratory Only

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United States District Court for the Central District of California, No. CV 97-1554

EMPLOYEE INTERVIEW CANDIDATES

NAME	PRESENT LOCATION	PHONE#	REFERENCE TIME	AREAS	JOB TITLES	DATE	TIME	LOCATION
Frank Patota	STL IV	65205	1978-present	STL IV	Test Engineer, Engineer In Charge			
Tom Marks	CTL III Hypergol	65907	1960s-present	??	Technician			
Stan Kacin (retired, flex force)	Facilities	62606	1960-1970	STL IV	Facilities Engineer	Thu 8/20	10:00-11:00	Desoto B/101 CR201
Jim Lang		65160	1960s-present	Various	Engineer, Engineer In Charge, Manager	Thu 8/20	2:30-3:30	SSFL, B436 Jim's office
Lynn McKie	ALFA	65401	1960s-present	Alfa, Bravo	Technician			
Larry Manring (retired, flex force)	CTL III	66097	1956-1992	ALFA, Bravo	Technician	Fri 8/21	10:30-11:30	CTL III
Bob Metzner	APTF	65143	1978-present	APTF	Engineer, Engineer In Charge	Fri 8/21	9:00-10:00	APTF
Jim Mitchell (retired, flex force)	APTF	60473	1960s-??	APTF	??	Fri 8/21	9:00-10:00	APTF
Les Rogers	APTF	65057	1960-present	APTF	Technician	Fri 8/21	9:00-10:00	APTF
Ed Embry	Equip Lab		1960-present	COCA	Technician	Thu 8/20	1:00-2:00	SSFL B/301
Don Pfremmer (retired, flex force)	Equip Lab		1960s-present	??	Engineer, Manager	Thu 8/20	1:00-2:00	SSFL B/301
Hal Turnip	Equip Lab		1960s-present	ALFA, Bravo	Technician	Thu 8/20	1:00-2:00	SSFL B/301
Rocky Masmussen	ALFA, Union Rep	65081	1958-present	CTL I, CTL III, STL IV, COCA, BOWL, BRAVO	Technician	Fri 8/21	8:00-9:00	SSFL, Rocky's office
Bob Huffman	ALFA, Union Rep	65722				Fri 8/21	8:00-9:00	SSFL, Rocky's office

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Tom Marks	CTL III Hypergol	65907	1960s-present	??	Technician		

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Personal Resume Of:

James N. Mitchell
17221 Rinaldi Street
Granada Hills, California
Home Phone: 363-3732
Plant Phone (Rocketdyne): 884-4000, ext. 5441

KIM O'ROURKE
x 6-9446

Personal Data:

U.S. Citizen - Draft Classification: 3A
Married, 3 children
Age: 31
Height: 5' 9½"
Weight: 155 pounds
Secret Clearance

Education:

Eldorado County High School: Placerville, California - 1956 Graduate

Sierra College: Auburn, California - Received Associate of Arts, Engineering, June 1958

California State Polytechnic College - Received Bachelor of Science,
San Luis Obispo, California Mechanical Engineering, June 1961

San Fernando Valley State College - Presently taking graduate work toward a Master's Degree in Engineering in the major field of Thermodynamic and Transport Processes.

Engineer Analysis (596A) 3 units	1-25-69 completed
Engineer Analysis (596B) 3 units	presently enrolled

Rocketdyne Training Courses:

Propulsion System Familiarization	25½ hrs.	8-14-61	completed
Test Facility Systems	12	8-1-61	"
Rocketdyne Drawing System	15	9-6-61	"
Advanced Manufacturing Techniques	9	9-20-61	"
Liquid Propellant Handling	7½	7-17-64	"
High Pressure System	10½	9-22-64	"

Employment:

Rocketdyne, Division of North American Rockwell, Corporation - 26 June 1961 to Present

11 July 1966 to Present:

Assigned to Components Test Laboratory III at Santa Susana Field Laboratory as responsible test engineer in charge of conducting production acceptance tests on J-2 augmented spark igniters, reducing test data, and preparing acceptance test reports. Also, conducted R&D tests on advanced J-2 liquid oxygen turbopumps. In addition, responsibilities included conducting production acceptance and R&D tests on J-2 liquid hydrogen turbopumps (including gas generators) and conducting gas generator tests to evaluate temperature transducers.

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